Technical Advice for Cleanup of Accumulated Waste Sites on Tribal Lands

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Introduction

Sound solid waste management presents a number of unique challenges in small communities and/or rural areas. Among these challenges are climate conditions, low population density, limited financial resources, and a lack of ready alternatives. In the past, solid waste was often allowed to accumulate wherever it was convenient to leave it, with little or no regulation or consideration for the protection of human health and the environment. This practice is known as roadside dumping or midnight dumping and resulted in deposits of scattered waste on tribal property.

The information contained in this manual has been compiled by the United States Environmental Protection Agency Region 9 to assist those tribes wishing to upgrade their solid waste management practices by removing waste from these roadside dumps for disposal in regulated landfills. Section 1 of the document provides technical advice for solid waste cleanup activities and Appendix I provides a sample solid waste cleanup and removal plan. This manual is offered to Indian tribes to assist them with decision making and waste removal implementation. It is intended to provide technical advice and assistance. This technical advice is not applicable to areas formerly or currently owned and operated as waste disposal sites; nor is it applicable to disposal sites composed of hazardous waste.

Section 4005 of the Resource Conservation and Recovery Act, commonly referred to as RCRA Subtitle D, contains requirements for the disposal of solid waste in specific, regulated facilities known as Municipal Solid Waste Landfills, or "MSWLFs." These requirements are codified in 40 CFR Part 258. This document is not intended to address the legal responsibilities of owners or operators of facilities regulated under EPA regulatory programs. If you have questions regarding the legal requirements affecting solid waste facilities, please contact your USEPA Regional office at the number listed in Attachment VI: Contact Information.

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The Clean Up and Removal of Accumulated Waste Sites on Tribal Lands

THE CLEANUP PLAN

This section addresses activities that help ensure that a clean up is conducted in a cost-effective and environmentally sound manner. Gathering adequate information and formulating contingency plans prior to actually starting the project will decrease the number of unforeseen incidents which lead to lost time, cost overruns, accidents, or inadequate site clean up.

It is therefore strongly recommended that a comprehensive Cleanup Plan be developed for each waste site. The following sections and information should be included in your Cleanup Plan. Information on possible funding sources for solid waste cleanup activities may be found at the EPA web page http://www.epa.gov/epaoswer/non-hw/tribal/finance.htm or by calling the appropriate EPA regional solid waste Indian coordination office listed in Appendix VI of this document.

INTRODUCTION

Begin the introduction with a general description of the site location, especially in relation to the nearest populated area. A description of the regulatory status of the site should be included. A description and explanation of the jurisdiction for the site is necessary to establish legal responsibilities. Information upon which the plan is based should be briefly described in the event a reviewer wants to look at the data used to develop the Cleanup Plan.

ENVIRONMENTAL AND SITE DESCRIPTION

LOCATION

Provide specific directions to the site. Ensure that enough information is included so that someone unfamiliar with the area could find the site. Geologic survey maps often provide valuable site location information.

POPULATION

How many people live within two miles of the site? Are there are any immediate neighbors? A complete description of the local population, including their concerns and any issues unique to the site will help interested parties assess potential impacts on the community. For example, nuisance factors such as the smell of excavating rotting waste or disposal routes through neighborhoods should be identified here.

SITE USE

Estimate how many people currently use the site, and note others who may potentially use the site. Describe the current activity of the site, i.e., abandoned, active, heavy, light, etc.

SITE SIZE AND FEATURES

Specific information about the site should include the following:

(a) Area of the site, in yards (Multiply the length of the site by its width).

(b) Volume of waste in cubic yards (multiply area by the average depth of the waste). If the main body of waste is in a trench or other depression, estimate and include the volume of waste outside of the depression.

(c) Waste distribution at the site. Is it in a trench, scattered on the surface, mounded?

(d) Type of waste present, i.e., household, industrial, yard, dead animals, hazardous, white goods, automobiles, tires, batteries, barrels and drums, etc.

White goods - Note whether motors, transmissions, or compressors are present.

Automobiles - Note whether engines, transmissions, differentials, radiators, brake master cylinders, batteries, and air conditioners are present and whether these items still contain their fluids. Proper disposal of tires involves special procedures such as proper burning, chipping or shredding. Buried tires tend to float in landfills and may eventually work their way back to the surface. Improper disposal of tires also creates rodent, snake, and/or insect habitat. Since these animals are frequently disease vectors, there is the potential for public health concerns. See Appendix I, Section E - Sample Health and Safety Plan - Biological Hazards for more information.

Barrels and drums - If the original contents of barrels and drums cannot be determined, then these containers should be treated as if they contain hazardous materials. It may be best to conduct preliminary reconnaissance at distance with binoculars and assess potential hazardous conditions. Take particular note of any bulging containers. Bulging may indicate that contents are under pressure and should be handled accordingly.

Demolition Debris - Demolition debris may contain lead or asbestos. If lead or asbestos is suspected, contact the state or federal EPA for assistance with the special handling and reporting requirements for these wastes.

Construction and demolition waste can also be reclaimed, reused, and recycles. Look for facilities where these wastes may be reused if they don't require special handling.

Sewage sludge - Pathogens and heavy metals are often present and may pose disposal problems.

Compressed gas cylinders - These have the potential to become projectiles or explode when disturbed.

Known industrial wastes such as plastics, resins, pulp, rubber, stone, etc. may be hazardous.

(e) Describe the site location in relation to the surface and subsurface geology and natural features of the land. For example:

Is the site located in or adjacent to an arroyo, wash, canyon, intermittent stream or riverbed, pond, or lake? Is it or on a hillside or hilltop?

What is the distance from the site to these nearby features? Is the site in a seasonal flood zone?

What is the distance from the site to the highest seasonal high water mark?

Estimate the site surface gradient and determine site surface water runoff patterns. Does surface water drain from the site to any nearby watercourse? Plot these features on a map of the site.

Take pictures from each of the four sides of the site showing the surrounding topography.

Do any of the surrounding surface features show signs of wastes being wind blown or washed down from the disposal site?

Identify and take pictures of any stressed vegetation near or down gradient from the site, since this may be a sign of contamination. Identify and take pictures of any areas of stained soils (e.g., soils stained by used oil dumping, etc.).

Plot the location of any stressed vegetation and/or stained soil on a map of the site.

Describe the climatology of the area. What are the annual precipitation and evaporation rates? What are the yearly rainfall patterns. Does all of the rainfall occur during a few months of the year. Are there seasonal variations that could affect on-site work?

Give the depth to groundwater (the uppermost aquifer) at the disposal site. If known, describe the water quality of the underlying aquifer (e.g., is the aquifer suitable for drinking water purposes?)

Describe the soil geology beneath the site. This information may be obtained from well drilling records, from current United States Geological Survey (USGS) maps, or by drilling geophysical test borings if data is not readily available.

Based on the geophysical characteristics of the underlying soils, assess whether, and to what extent, the existing geology affords any protection to the aquifer.

(f) Note the presence of any industries, businesses, hospitals, and schools within close proximity of the site (e.g., one mile).

(g) Characterize and describe any potential hazards or problems relating to clean up/removal in the vicinity of the site. Look for such things as water lines, gas lines, power lines, and accesses to the site. Will temporary roads need to be constructed to allow access for necessary equipment? What is the destination of excavated wastes and will they need to be hauled out through, or near residential areas?

(h) Describe the distance to active wells and other water sources, such as lakes, ponds, rivers, streams, springs, and windmill tanks. Are these up gradient or down gradient from the site and what, if any, use is made of them. For example, is a stream the source of potable water for local residents?

(i) Describe the distance to sewage lagoons or septic systems and whether these systems are up gradient or down gradient from the site.

(j) Include any other general information relevant to the clean up of the site. If any of the elements described in (a) though (i) of this section are not present, this should be stated.

SITE HISTORY

Describe the history of the waste site. Information may often be obtained from a historical records search and should include the following:

(a) Is it known who may have contributed waste at the site?

(b) Are there any records or other documentation, i.e., pictures, aerial photographs, etc. about the site?

(c) Have wastes been burned at the site? Is it possible that explosives may be present?

(d) How has hazardous waste been disposed of in the surrounding area? If there is no local arrangement for disposal of hazardous waste, caution should be exercised in that hazardous wastes may be present at the site. See Appendix II for a description of some of the hazardous materials which may be encountered during a clean up and a listing of common household hazardous wastes.

REMEDIATION PLAN

Remediation is the process of clean up. As used in this document, a site which has undergone remediation has had wastes removed, but has not necessarily been returned to its original condition or prepared for specific future uses. Remediation readies the site for reclamation (see below).

The Remediation Plan describes clean up and removal methods in detail. It lists personnel and equipment requirements for each activity, as well as the cost of each phase.

Essential equipment includes the following:

- front loader;
- dozer;
- dump truck;
- sanitation facilities including hand washing facilities;
- first aid supplies;
- emergency eye wash facilities;

- personal safety equipment;
- decontamination supplies if site contains (or is suspected of containing) biological or hazardous waste.

Essential personnel include the following:

- site supervisor;
- qualified Health and Safety Officer;
- qualified, licensed equipment operators;
- workers/laborers (specify number).

Additional equipment and/or personnel may be required depending on the condition found at specific sites. For example, field air monitoring equipment for detection of flammable or toxic gases may be needed if buried waste is being excavated, because pockets of such gases might lead to worker injuries if they are not detected and mitigated.

Developing accurate cost estimates for clean up and removal may require an individual experienced in road construction and/or construction site development. The following is a list of remediation activities that should be addressed in the Remediation Plan.

(a) Identify facilities which could recycle or reuse certain wastes. Discarded items such as glass, metals, aluminum, white goods, plastics, and construction/demolition debris are easily and best recycled if a facility is within a reasonable distance.

(b) To avoid costly surprises, obtain written confirmation regarding the types of waste that are accepted at the intended disposal facility to avoid costly surprises. Non-hazardous solid waste not recycled or transported for reuse should go to a RCRA Subtitle D municipal solid waste facility.

(c) Estimate the volume and weight per cubic yard of materials to be removed. (Uncompacted municipal waste weighs about 160 lbs. per cubic yard.)

(d) Consider equipment operation and maintenance, and any necessary decontamination of equipment. Include storage for fuel, water, and other necessary supplies.

(e) Determine accessibility of the site. For example, if the site is in an arroyo or a wash, a temporary access road may need to be constructed.

(f) Consider what, if any, special mitigation/control measures might be required, i.e., dust, storm water, or odor control.

(g) Determine the time to load at the clean up site, unload at disposal site, and the distance to the disposal site.

(h) Determine disposal and recycling costs at the disposal site and recycling center where waste will be taken.

(i) Consider segregation and removal of special wastes such as automobile bodies, white goods, asbestos, and medical waste.

(j) Plan for testing of unknown materials for the presence of hazardous wastes. Include information on waste reduction and recycling in public materials and meetings.

(k) Plan for public information campaigns, public meetings, and notices.

(l) Plan for control of the site to limit public access.

(m) Consider health and safety training and equipment.

(n) Consider rodent trapping and disposal.

(o) Consider any on-site waste processing before final removal, such as shredding tires on-site to reduce volume.

(p) Determine workers wages and insurance. Be sure to include the Site Supervisor and Health and Safety Officer(s).

(q) Consider the need for temporary office space.

NOTE: Asbestos, lead, and other listed hazardous materials require special handling and reporting. It will be necessary to seek technical advice for disposal of these materials from the state or federal EPA.

Automobile bodies and white goods also require separate removal techniques. We recommend that a local metals salvager be contacted for assistance in removing these wastes. Since these are some of the items that can be recycled, skillful negotiation may result in diminished or eliminated removal costs.

The bulk of a clean up can be accomplished mechanically. Often, however, there is wind-blown litter and scattered waste that must be consolidated into the main body of waste. Unfortunately, most of this pick-up work must be done by hand. (See the Health and Safety Plan for specific requirements regarding personnel safety equipment and procedures. For safety, the number of workers at a site being cleaned up should be kept to the minimum number actually needed to accomplish given tasks in a day.)

RECLAMATION PLAN

Reclamation is the return of the area to its original condition or to as close to its original condition as is reasonable. Reclamation follows the remediation process and is a site specific task. It may involve obtaining fill for erosion control and/or topsoil for replanting. Grading may also be necessary. If contaminated soils will be left in place, reclamation may involve placement of some kind of cover. Reclamation, can require engineering to reestablish grade conditions, or it may be as simple as raking the site.

It is important to first determine the level of reclamation that will be undertaken (See Appendix III - Site Clean up). Consideration should be given to the proximity of nearby residences and the likely future uses of the site. It is also important to note any physical features of the area that may impact future use. For example, is the location prone to flooding?

Describe in detail the requirements for reclamation, including personnel, equipment, and costs. Since reclamation is such a site specific function, we recommend that assistance in the preparation

of the Reclamation Plan be sought from the regional BIA, Indian Health Service (IHS), state or federal EPA offices, or a local environmental engineering firm.

HEALTH AND SAFETY PLAN

The objective of a Health and Safety Plan (HSP) is to assure that all work conducted in the process of waste site clean up and removal is done as safe as possible with full consideration and awareness of potential risks. The goal of this plan is to conduct a clean up and removal project in with no injury or impairment to human health.

Describe the health and safety concerns related to the clean up of the site. In developing a HSP a site/project specific hazard assessment must be conducted to identify and evaluate all potential risks. For example, falling rock hazards at sites located in canyons, potential heat stress or stroke, animal hazards such as snakes, and the various potential human health hazards presented by the wastes. The HSP should include detailed information, as well as anticipated costs for each activity. Information should include, but not be limited to, potential hazards, including biological hazards, precautions to be taken, equipment, clothing, training of personnel, Health and Safety Officer duties, notices and signs, and activities to inform and protect the public. Maps showing the location and route to the nearest hospital should be on site at all times. A contingency plan that details procedures to be implemented in case of an emergency, such as an explosion, or release of hazardous materials, should be prepared and included in the first day briefing of workers.

PUBLIC PARTICIPATION PLAN

Describe the Public Participation Plan, including proposed public meetings, newspaper notices, posters, community education, etc. Include projected costs for each aspect of the Plan. Assistance on questions you might have in regards to planning for community involvement/public participation may be obtained by calling the toll free EPA Superfund/RCRA Community Involvement Helpline at 1-800-231-3075.

RECORD KEEPING

Records of all activities related to the closure of the site should be kept on a daily basis and the location of these records posted. These records should include information such as the construction/clean up activities that occur each day, weather conditions, amounts of wastes removed and where they were sent for disposal, and any unexpected wastes that were discovered. The name and telephone number of a contact person with access to cleanup records during clean up should be included. Note where the records will be kept after clean up is completed and the name and telephone number of the person in charge of the final records. It's recommended that records be maintained and available for seven years after completion of clean up. This section should also include any costs for generating and storing the daily records.

Certification that all remediation and reclamation measures have been completed should be placed in the permanent record. The certification should be signed by the tribal oversight authority and should include a description of the sampling, testing, and analysis that was carried out at the site.

APPENDIX I

Sample Cleanup and Removal Plan

Backforty Dumping Area Cleanup and Removal Plan

A. INTRODUCTION

GENERAL LOCATION

This Cleanup and Removal Plan has been developed for the site known as Backforty Dumping Area. It is located in and around a natural watercourse known as Water Wash. Appaloosa, Arizona is the nearest town, approximately 1.5 miles west of the site. The site is located entirely within the reservation boundaries of the Native American Tribe. The natural course of the wash runs in the direction of northeast to southwest.

REGULATORY STATUS

A Cleanup and Removal Plan is the best and most practical way to assure that all necessary activities and their costs are included in planning for the clean up process. A Cleanup and Removal Plan will also keep to a minimum unforeseen incidents which result in lost time, cost overruns, accidents, or inadequate site clean up.

The Backforty Dumping Area is located in and immediately adjacent to a natural watercourse, thereby violating the Clean Water Act (40 CFR Part 230). In addition, there is an airport serving piston-type aircraft within 5,000 feet of the Backforty Dumping Area creating a potential bird hazard for aircraft. Businesses and residences are also located within a mile of the site. Business are responsible for contracting for removal of their own solid waste off the Native American Tribe Reservation.

JURISDICTION - See Appendix IV

INFORMATION USED

There are no maintenance and/or operational records available for this site. Information contained in this plan was obtained by visits to and visual observation of the site on July 31, 1998 and August 11, 1998 and represents the existing conditions of the site at that time. These visits and observations were made jointly by Jane Jones, representative for the Native American Tribe, and John Franks, site supervisor for Arid Environments Engineering, Inc., contractor for the clean up of this site.

B. ENVIRONMENTAL AND SITE DESCRIPTION

LOCATION

The seven discrete waste disposal areas that constitute the Backforty Dumping Area are all located along the approximately 1.5 mile length of Water Wash. Water Wash begins less than a quarter mile south of the fairgrounds, which are in turn located on the eastern edge of the town of Appaloosa.

POPULATION

The town of Appaloosa has a population of 4,513 (1990 Census). Population in the surrounding area is about 5,225 persons. This is the highest population density on the Reservation. There are residences in the area immediately around the site, the closest being 0.6 miles from the northeastern end of the Wash. The community is concerned that hazardous wastes will be hauled through town to a disposal facility. These concerns will be addressed in the Public Participation Plan.

SITE USE

The Backforty Dumping Area received periodic waste deposits from the Appaloosa community for approximately 10 years prior to January 1995. The Backforty Dump is no longer used since an open top bin was made available in the town of Appaloosa in January of 1995. Household solid waste is accepted there for a fee. Because of the fee and the fact that there is no convenient alternative disposal for special wastes such as tires and white goods, it is reasonable to assume that casual disposal at Backforty

Dumping Area still occurs from time to time. This site has never been maintained in any way. It was simply the convenient and accepted place to dispose of waste as people settled in the area as the town grew.

SITE SIZE AND FEATURES

(a-d) Area: There are seven discrete waste disposal areas within the Backforty Dumping Area. They extend for approximately 1.5 miles along the length of Water Wash. The average width of the disposal areas is 50 feet and the average depth is 20 feet. There is no sewage sludge or industrial waste at any of the disposal areas. It is possible that compressed gas cylinders are present since propane gas was used for heating and cooking prior to 1987 when electricity became available in Appaloosa. See below for the area, volume of waste, distribution, and type of waste present for each disposal area.

(e) Geology and natural features: See individual descriptions for location and gradient. The following geological information applies to all waste disposal areas.

1) Depth to groundwater- 20 feet
2) Soil geology-
soil type: silty clay
geological strata to groundwater: silty clay
3) Annual precipitation- 18 inches per year, annual evaporation 140 inches per year. This area is subject to heavy cloudbursts resulting in immediate heavy run-off and/or flash flooding
4) Aquifer information- confined
5) Soil permeability- permeable
6) Drainage- located in a watercourse

(f) Industries, businesses, hospitals, or schools. There is one business, a restaurant, located within one mile of the site. There are no industries, hospitals, or schools.

(g) Potential hazards- See individual descriptions. Except as noted for disposal areas # 2 and # 4, no temporary access roads will be required for this remediation project. Wastes will be hauled approximately 63 miles to the XYZ Landfill. The waste must be trucked trough the town of

Appaloosa. Citizen concerns over this process will be addressed in the

Public Participation Plan and will include hours of operation, proper cover for loaded trucks, etc.

(h) Proximity to wells and other water sources - There are no wells or other water sources within one mile. As noted in (e) 3 above, however, this area has the potential to become a watercourse after heavy rains.

(i) Proximity to sewage lagoons - There are no sewage lagoons within one mile of the site.

(j) Other information- There are residences and one small airport (serving piston-type aircraft) within one mile of the site. There are no buildings on the site. Two major access dirt roads have been blocked off by fencing and currently only one unimproved dirt road provides access. There are no electrical or natural gas lines within one mile of the site. A gray water drain from the rodeo grounds passes under disposal area # 7 and opens into the wash.

SITE HISTORY

See above under *Site Use*. There are no records about the site. There are indications that this area was used by local residents for disposal of the usual household wastes and there were no restrictions on what was placed there. There are no indications that any company or individual was responsible for the operation of the Backforty Dumping Area at any time. This is a small agrarian community with no industry or sewage treatment facilities. With the exception of household hazardous waste and special wastes such as automobile bodies and white goods, it is unlikely that hazardous wastes in appreciable quantities will be found at this site. Anecdotal evidence indicates that the site occasionally caught on fire but there was no deliberate or routine burning. There is no evidence to suggest unexploded ordnance may be present at the site.

INDIVIDUAL WASTE DISPOSAL AREA DESCRIPTIONS

<u>Disposal Area # 1</u> Estimated measurements are 35 yards long X 20 yards wide X 2 yards deep. Area #1 contains approximately 1400 cubic yards of solid waste. Waste is located in a trench, there is no appreciable amount of material scattered out side of the trench. Potential hazardous waste items are used car batteries, labeled/unlabeled 5-gallon steel containers, labeled and unlabeled 1-gallon paint cans, water heaters and washing machines. The washing machines still contain their motors. Waste types are household, car body (without motor, transmission, etc.), oil waste,

automobile parts, construction debris, yard waste, textiles, white goods and partially decayed animal carcasses. Exercise caution with construction debris as it may contain asbestos or lead. See Appendix II *Hazardous Materials* for mandatory reporting and disposal information. Waste is located in the wash along the northwest wall. The walls of the wash are near vertical with a slope approaching 90 degrees.

Disposal Area # 2 Estimated measurements are 150 yards long X 50 yards wide X 0.5 yards deep. Area contains approximately 3750 cubic yards of solid waste. Waste is located in a trench, there is also mounded waste and considerable surface scatter. Potential hazardous waste items are car batteries, unlabeled 1-gallon paint container, five-gallon asphalt petroleum container and three empty 55-gallon drums. Construction debris, textiles, yard waste, household waste, furniture, car parts and oil waste are also present. Solid waste is located in the wash, on the slope and on top of the northwest wall. The south wall of the wash is near vertical. The north wall of the wash has a slope averaging about 80 degrees.

***Disposal Area # 3* Estimated measurements are 30 yards long X 20 yards wide X 1 yard deep. Area contains approximately 600 cubic yards of solid waste. Waste is located in a trench with little surface scatter. There do not appear to be any potentially hazardous waste items in this area. Waste types are household, textiles, furniture, oil waste and automobile parts. Solid waste is located in the wash along the northwest wall. The walls of the wash are near a vertical slope approaching 90 degrees.**

***Disposal Area # 4* Estimated measurements are 118 yards long X 12 yards wide X 1 yard deep. Area contains approximately 1416 cubic yards of solid waste. Waste is surface scatter that will require manual clean up. Potential hazardous waste items are refrigerators, water heaters, washing machines. All of these items contain their motors/compressors. Waste types are household, construction debris, household hazardous waste, white goods, auto parts, oil waste, furniture, and textiles. Waste is located along the unimproved dirt road and in the wash. The northwest wall of the wash has a slope averaging about 80 degrees. The southeast wall is vertical.**

***Disposal Area # 5* Estimated measurements are 125 yards long X 5 yards wide X 0.5 yards deep along the unimproved dirt road. Estimated measurements for solid waste buried along the north wall of the wash are approximately 20 yards long X 10 yards wide X 3 yards deep. Area contains approximately 920 cubic yards of solid waste, approximately 320 cubic yards located along the unimproved dirt road and approximately 600**

cubic yards buried along the north wall of the wash. Waste is surface scatter along the road with some in a shallow trench along the wall. There do not appear to be any potentially hazardous waste items in this area. Waste types are household, construction debris, white goods (with motors/compressors), furniture, oil waste and automobile parts. The northwest wall is vertical and the southeast wall has a slope approaching 80 degrees.

Disposal Area # 6 **Estimated measurements are 10 yards long X 20 yards wide X 1 yard deep. Area contains approximately 200 cubic yards of solid waste. Waste is mounded. There do not appear to be any potentially hazardous waste items in this area. Waste types are household, construction debris and asphalt debris. Solid waste is located along the north wall of the wash. The walls of the wash are near vertical with a slope approaching 90 degrees.**

Disposal Area # 7 **The wash at this point is estimated to be approximately 10 yards long X 10 yards wide X 0.5 yards deep. Area contains approximately 50 cubic yards of solid waste. Waste is mounded and does not appear to contain any potentially hazardous waste items. Waste types are household and construction debris. Waste is located along the slope of the northwest wall of the wash. The north wall has a slope approaching 80 degrees and the south wall is near vertical.**

C. REMEDIATION PLAN

To reduce the potential exposure to infectious agents and products, the Native American Tribe's Environmental Health crew will trap rodents for 32 days, beginning three days prior to the arrival of the remediation crew. The partially decayed animal carcasses identified in disposal site #1 will be burned on the spot using gasoline.

Recycling centers for glass, metals, and white goods have been identified. When feasible, segregation and transportation of these materials to recycling centers has been arranged. Written confirmation that XYZ Landfill will accept wastes from Backforty Dumping Area is on file at the Site Supervisor's office and will become part of the permanent record of this remediation project. It is not necessary to do any on-site processing of wastes before final removal from these disposal areas. Hazardous wastes, tires, white goods, and automobile bodies will be disposed of separately. See below for details.

Temporary modular buildings will be used for the Site Supervisor's office, equipment maintenance area, and storage areas for equipment and supplies. The contractor, Arid Environments Engineering, Inc., shall provide these temporary structures and be responsible for them during the project. Arid Environments Engineering, Inc. shall also remove these structures when work has been completed. Because of the danger of flash flooding in the area remediation work will be conducted only during dry months of the year. If thunderstorms occur while work is in progress work will be stopped immediately and the workers evacuated. See the Health and Safety Plan for details.

Waste in trenches or mounds will be picked up with a front-end loader and placed into 40-cubic-yard bins. It may be necessary for workers to use lines to descend to the bottom of the wash in order to retrieve certain wastes. For those areas which have surface-scattered waste manual pick-up will be necessary. Workers outfitted with long tongs or pointed stakes shall collect such scattered waste in large plastic bags. These bags will be collected as necessary and also removed to the waste bins. Suggested bin locations during the clean up are on the north side of disposal area # 2 and on the north side of disposal area # 5. These bins will be taken to a staging area near disposal area # 5 and the waste transferred to dump trucks. A dragline and pulleys will be used to remove waste from the wash and it will also be placed in dump trucks at the rim. These trucks will then be covered and proceed to XYZ landfill for waste disposal. The firm of J.C. Dumping will be responsible for transport of the waste from the site to the landfill. A temporary access road into the wash may be necessary at disposal areas # 2 and # 4.

The following items will be separated and properly disposed of by Southwest Hazard Removal Company:

1. **Hazardous or potentially hazardous waste;**
2. **Tires.**

The suggested workforce includes at least one Field Supervisor, one Health and Safety Officer, one heavy equipment operator, and one laborer for each of the areas being worked. Local workers will be hired to make up the labor force. The local metal salvaging company, AFH, Inc. has been hired to remove all automobile bodies and white goods from the site.

Necessary equipment for this project includes one front-end loader, one backhoe, one 200 horsepower dozer, and 193 40-cubic-yard bins.

Costs to clean up and remove wastes from this site are based on material amount and sources, labor, and equipment. Estimated cost: $151,047.90. The project is expected to last 29 working days. Estimated total volume of solid waste (all disposal areas): 8336 cubic yards. See Table I-1 for tasks, equipment and costs.

D. RECLAMATION PLAN

It will be necessary to reconstruct the natural watercourse of Water Wash and restore it to its original condition. To accomplish this approximately 600 cubic yards of backfill will be obtained from the excavation of a building site on tribal land to the north of the town of Appaloosa. There will be no cost for obtaining this material. It will be placed along the northwest wall of disposal area # 5. Boulders and cement debris from disposal area # 7 will also be moved to this area for erosion control.
A 9-yard end dump truck, a dozer, and frontloader will be necessary for transportation and placement of backfill and boulder and cement debris. Personnel will include heavy equipment operators for each piece of equipment, two laborers, and one Health and Safety Officer. Contact the Army Corps of Engineers regarding necessary permits, etc.

Costs

Materials transportation:	**$375.00**
Labor:	**$1,675.00**
Total	**$2,050.00**

TABLE I-1 COST ESTIMATE

COST ESTIMATE

Activity	Estimated Cost
1. Disposal of 208 forty cubic yard bins at $600 per pull	$124,800
Additional landfill fee:	
approximately 38 tires @ $6.50 each	$247.00
approximately 19 white goods @ $10.50 ea.	$199.50
subtotal	$125,246.50
2. Heavy Equipment:	
front end loader rental fee for 29 days @ $437.50/day	$12,687.50
bulldozer rental fee for 2 days @ $225.00/day	$450.00
dump truck to haul borrow material, 1 day @ $73.90/day	$73.90
subtotal	$13,211.14
3. Safety Training:	
OSHA safety/equipment training, 10 people @ $25/ student	$250.00
4. Personnel:	
Heavy equipment operators:	
salary for front-end loader operator @ $20/hr for 29 days	$4,640.00
salary for bulldozer operator @ $20/hr for 2 days	$320.00
Technical Staff:	
safety Officer @ $15/hr for 29 days	$3,480.00
clean-up crew - five laborers @ $7/hr. for 10 days	$2,800.00
subtotal	$11,240.00
5. Additional Equipment:	
signs, fencing material, public relations	$1,000.00
plastic bags and trash picks	$100.00
subtotal	$1,100.00
TOTAL	$151,047.90

E. HEALTH AND SAFETY PLAN

[Portions of this Health and Safety plan are derived from a Health and Safety Plan developed by the Bureau of Indian Affairs, Navajo Office.]

1) Potential Hazards

PHYSICAL - associated with working near construction equipment:

Crumbling high walls of canyons, washes and arroyos
Falling objects when on high walls
Stressed cables and/or ropes
Vehicles
Cuts, bruises, and injuries from handling solid waste
Trips, falls and slides (personal and land)
Flying objects
Glare
Exploding aerosols, compressed gas cylinders, and cans
Heat injury
Fire/Combustible gas ignition
Dust

BIOLOGICAL

Hantavirus
Plague
Unknown viruses and bacteria
Venomous reptiles
Venomous and other insects
Poisonous or toxic plants.

CHEMICAL

Particulate matter from asbestos, burning waste, and plants such as poison oak or poison ivy.
Unknown vapors
Vehicle exhaust

OTHER

Inclement weather

2) PRECAUTIONS

GENERAL- All workers shall work in the "buddy system", maintaining visual contact with each other when on the job site. Workers shall not wear headphones or any other device that could impair hearing heavy equipment alarms or other warnings. Respiratory protection shall be worn if workers must enter any area in which there may be an excessive concentration of airborne contaminants. Workers actually handling or in the immediate vicinity of solid waste that is being moved shall wear at least a half mask respirator with twin NIOSH approved high efficiency cartridges. Workers required to wear respirators shall receive six hours training in the use and care of respirators. Workers subject to dust other than solid waste dust shall be required to wear quarter-face dust masks.

PERSONAL PROTECTIVE EQUIPMENT - All employees/workers on these projects shall be issued safety equipment and be required to wear the following: hard hat, eye protection (goggles with sun glasses or shatter-proof sun glasses), appropriate respiratory protection, long sleeve shirt, long pants, Tyvek overalls, steel-toed boots (over boots are required for those actually working in the site), and latex gloves under heavy leather work gloves. This equipment shall be worn whenever actively working on the job site. If any of the issued equipment becomes damaged, torn, etc., such that the effectiveness is questionable the worker will immediately be removed from the work area and have the damaged item replaced or repaired prior to reentering the job site. Fire extinguishers should also be readily available to personnel.

FIRST AID - The Contractor shall insure that there is a first aid kit in

each vehicle on site complete with antiseptics and bandages. The Contractor/Site Supervisor and Health and Safety Officer shall also have a list of current, local emergency phone numbers, or other means of emergency communication, available in case an injury requires professional emergency medical services. Addresses and phone numbers of nearby hospitals, emergency rooms or trauma units should also be included.

PERSONAL HYGIENE - The Contractor shall insure that there is an emergency eye wash stand, portable toilet, and an adequate supply of potable water for drinking and washing prior to eating or leaving the work site. Tyvek[1] overalls and any other outer personal protective clothing shall not be worn outside the job site or to an employee's home. Soiled Tyvek overalls will be collected daily in a paper or plastic bag and properly disposed of. The project Health and Safety Officer shall assure compliance with this mandate.

INCLEMENT WEATHER - During the monsoon season violent afternoon thundershowers may occur and may be accompanied by lightning and/or flash flooding. These conditions are serious and may occur without warning. At the beginning of each workday the Health and Safety Officer or the Site Supervisor shall review the weather forecast, paying particular attention to conditions up stream from the work site. The Health and Safety Officer or the Site Supervisor may order a work stoppage if conditions warrant such action. Workers on projects conducted during this season shall take the following precautions. Electrical storms: If a crane is in use it shall be lowered and all work stopped. Workers shall assemble in enclosed, rubber-tired vehicles until the storm passes or the decision is made to stop work for the day. Should a worker be caught away from a vehicle he/she should seek shelter in a low spot, such as ditches or concrete culverts, away from trees or large rocks. Thunder storms/heavy rain: flash flooding may occur during heavy rains. Workers in arroyos or washes should immediately evacuate these areas. The Site Supervisor shall conduct a head count to ensure that all workers are safe and accounted for whenever inclement weather causes a work stoppage.

3) SPECIFIC RISKS

a) Whenever heavy equipment is in the area, workers should be alert to the possibilities of injury due to vehicles backing up or sliding. The dust generated by churning tracks or wheels can be irritating to the respiratory system and carry disease-causing organisms. The exhaust from diesel engines is also injurious due to the toxic components released during combustion.

b) The edges of canyons, washes, arroyos, and landfills can be unstable. Workers are advised to stay well back from such areas, unless secured by OSHA approved safety harness systems. If a worker is being lowered into a canyon or arroyo, the lowering system shall be of the involuntary type so that an worker is secured regardless of the state of consciousness.

c) When scaling the sides of a canyon or high wall objects may fall from above onto a worker. Therefore, hard hats shall be worn on slopes and no more that one person at a time shall be on the slope. Personnel above or below the climber shall watch for falling materials. If any objects begin to fall, these personnel shall shout a warning to the climber so they may take evasive action.

d) If cables and pulley systems are used to haul materials up the face of a slope, all workers shall stand well back from the tightening cable, preferably behind shelter. Any person who notices a frayed or otherwise unsafe cable shall immediately report it to the Site Supervisor and Health and Safety Officer.

e) A valid state drivers license or commercial operators license is required for operators of all vehicles used at closure/clean up sites. No one shall ride in the bed of an ungated truck. All riders in a gated truck shall sit or lay down in the cargo bed and keep all parts of the body inside the truck bed.

f) The possibility of cuts or other open wounds exists when moving and collecting solid waste. Therefore, each worker must have had a Tetanus shot within the year prior to performing activities on this project. If a worker sustains an open wound he/she shall report immediately to the Site Supervisor for first aid. Such aid shall include cleansing the wound with soap and water, hydrogen

peroxide and/or iodine or an iodine compound such as "Betadine"[1]. The wound shall be dressed with an air and dirt tight bandage. If the Site Supervisor or Health and Safety Officer believes the wound is serious enough, the worker shall be evacuated to a medical facility for further treatment.

g) Workers shall be made aware of the possibility of tripping and falling into piles of solid waste. Such falls have the potential to cause injury and damage personal protective equipment. Waste piles are unstable, therefore workers shall not climb onto piles of solid waste.

h) When solid waste is being consolidated or otherwise moved, the heavy equipment will often cause parts of the load to be in compression. The stress on the debris and the subsequent release of that stress may cause metal and wood objects to fly out of the waste piles. Therefore, no worker shall be closer than 25 feet from a pile of solid waste when it is being moved.

i) Exposure to bright sunlight and/or reflected light from polished surfaces and freshly scratched metal over long periods can cause deep eye damage and result in degeneration of vision. Workers shall wear sunglasses whenever the Health and Safety Officer or Site Supervisor believes that conditions warrant. A worker may choose to wear such glasses any time he/she feels the need.

j) Solid waste often contains defective or partially used aerosol cans. These aerosol cans may contain such things as spray paints, pesticides, oven cleaners, spot removers, and/or petrochemicals. When these cans are compacted in the landfill or crushed by vehicles, they can release residues of the contents. These contents can burn the skin and clothes, release toxic vapors, and severely damage eyesight. Often, aerosol and other cans contained in a trash pile become unstable and can explode when heated by the sun or disturbed by handling. Workers shall be cautioned about picking up individual cans by hand.

[1] The use of a brand names in this document does not constitute an endorsement by the USEPA. Brand names are used as examples of appropriate products.

k) There exists a strong possibility for heat injury - heat distress, heat exhaustion and heat stroke - on projects being conducted during the summer months. Buddies shall observe each other for changes in the color of the skin and breathing rhythms. The Site Supervisor shall provide an air thermometer and take hourly temperature readings, which shall be recorded in the daily log by the Health and Safety Officer. Once the air temperature reaches 90° F 10-minute rest periods will be provided each hour. The Site Supervisor shall provide adequate shade, adequate cool water, and electrolyte replacements drinks, for the workers. The signs of heat exhaustion are a deep reddening of the skin, panting, and profuse sweating. The individual shall be removed to a cool or shady area and allowed to rest. In cases of heat stroke, the skin becomes pale, breathing becomes shallow and rapid, sweating stops, and the skin becomes dry. The victim can rapidly lose consciousness. *These conditions are life threatening and progress rapidly.* If any of these signs occur the victim must be cooled down as rapidly as possible. Wet compresses, ice rubbed on the wrists, and fanning will help. If conscious, the victim shall be encouraged to drink lots of cool water or preferably an electrolyte replacement drink. *Emergency medical assistance is mandatory.*

l) Asbestos in the form of roofing tiles, insulation, and/or broken pipe may be present in waste piles. 40 CFR Part 61.50 sets forth reporting requirements and mandatory standards for disposal of asbestos containing wastes. If such wastes are found at any site a contractor licensed to properly dispose of asbestos must be used for such disposal. Any materials that are suspected of containing asbestos should be thoroughly soaked with water prior to being handled. Paper dust masks are not effective for asbestos particles. For questions concerning either a potentially hazardous material and/or handling and disposition of potentially hazardous materials call the state or federal EPA.

m) Often there are fires, or the residues of fires, in the landfill trenches or scattered around surface dumps. Manipulating landfill debris can provide oxygen or fresh fuel to smoldering debris, which can cause fires to flare up. If a fire develops, the worker(s) shall notify the Health and Safety Officer. All workers shall be evacuated from the area of the fire until the Site Supervisor has investigated and determined the level of threat. Appropriate measures to extinguish the fire shall be used prior to resuming work.

n) There are very few reasons for a worker, other than an equipment operator, to enter any active trench or trench under construction. Workers on foot shall not be in a trench while heavy equipment is operating there. Only one worker at a time shall be in a trench where work is being conducted in the surrounding area.

BIOLOGICAL HAZARDS- If there is no evidence of biological contamination (plague or hantavirus) portions of this plan may be relaxed.

a) The dusts and vapors generated by disturbing mounds of solid waste can contain fungal spores, irritating products of decomposition, and disease bearing particulate. The foreman shall have a supply of dust masks available and ensure that workers wear them should conditions warrant or if a worker requests a mask. Masks shall be disposed of at the end of a work shift or more often if necessary. No worker shall wear another's mask. Paper masks provide no protection against bacteria, fungal spores, or viruses.

b) The threat of Hantavirus may exist at many work sites (see Appendix V for information on Hantavirus). Rodents are attracted to solid waste and are known carriers of the Hantavirus. Rodent nests and dead rodents shall be avoided by workers. The Site Supervisor shall have available a two-gallon pump sprayer containing a 1% aqueous chlorine bleach solution to soak any rodent nests discovered before moving solid waste. Any dead animals found at the site area shall be sprayed with the same solution prior to handling and disposal. Mechanical equipment such as frontloaders and dozers shall be used for handling and burial. If mechanical equipment is not available, tongs or shovels shall be used for handling dead animals and nests. Under no circumstances shall workers handle dead animals with their hands, even if gloved. Any personal protective equipment, boots, gloves, etc; that has come into contact with dead rodents or rodent nests shall be disinfected with a 1% aqueous chlorine bleach solution. Under no circumstances shall workers be allowed to leave the site without undergoing decontamination procedures.

To minimize exposure to biological hazards, rodent trapping may begin one week prior to commencing work and continue daily throughout the project.

Note: Trapping shall be conducted by personnel trained and certified to conduct rodent trapping. Under no circumstances should untrained personnel attempt to conduct animal trapping.

c) Plague (*Yersinia pestis* infection) occurs naturally in some wild rodent populations throughout much of the western United States, although most (90%) human cases occur in only four states (Arizona, California, Colorado, and New Mexico). The disease is transmitted through the bites of infectious rodent fleas, direct contact with infected animals, or, very rarely, inhalation of respiratory secretions from humans or cats having respiratory plague. To protect against flea bites Tyvek overalls shall be worn with the legs tucked into work boots and/or taped. Any bites shall be reported and treated with antiseptic as soon as noticed. The risk of transmission of plague to humans in the United States is greatest when outbreaks of plague occur among susceptible wild rodent hosts, such as prairie dogs, cats, and some burrowing ground squirrels. As with Hantavirus, rodents and cats on the work site shall be avoided. Operations that bring workers in close proximity to flea-infested rodent nests or burrows, or result in the disturbance of these structures, are particularly likely to increase human plague risks. Workers are advised always to avoid contact with any sick or dead animals. It is recommended that the CDC publication Prevention of Plague (citation follows) and the Health and Safety Plan of this document be consulted for guidance in worker protection.

<u>Citation:</u> CDC. 1996. Prevention of Plague. Recommendation of the Advisory Committee on Immunization Practices (ACIP). Morbidity and Mortality Weekly Report-Recommendations and Reports. 45:RR-14;i-iv and 1-15.

d) Other viruses and bacterial infections can be minimized through basic good hygiene. Workers shall wash their hands prior to eating, smoking, etc. The work uniform shall not be worn off the work site. A portable toilet will be available for use.

e) Poisonous snakes may be encountered during the movement of solid waste. Workers shall stay back from piles of trash being moved. Additionally, workers shall not place their hands under any boards, white goods, mattresses, etc., until the object has been

moved at least once by mechanical equipment.

f) The same precautions for snakes applies to venomous insects; scorpions, wasps, hornets and biting flies. Most flying insects are attracted to sweet smelling after-shaves, deodorants, perfumes and soaps, as well as body heat. Workers shall be advised to avoid the use of such products during work on solid waste sites. Mosquito sprays and insect repellents shall be worn if the Site Supervisor deems it necessary for worker protection, or if a worker desires to do so.

g) Used truck and automobile tires provide an ideal habitat for rodents, snakes, and poisonous insects such as mosquitoes, spiders, and scorpions. In wet areas water-filled tires serve as a breeding ground for mosquitoes and constitute a continuing public health threat because of the potential contribution they can make to outbreaks of encephalitis and other mosquito transmitted diseases. Rodent nests in discarded tires also have the potential to spread plague and Hantavirus if they are moved without proper decontamination. It is essential that discarded tires be decontaminated prior to their removal from the site to eliminate the spread of disease vectors to other areas.

h) There can be poisonous plants, such as poison oak or ivy, in and around the work areas. Workers shall avoid these plants. Additionally, the smoke from burning these plants can be particularly toxic, producing acute respiratory distress. Under no circumstances shall burning of these plants be allowed at or near the work site. Workers who are subjected to smoke from burning poisonous plants shall be evacuated from the area and taken to medical facilities for treatment.

4) HEALTH AND SAFETY OFFICER

All projects shall have at least one Health and Safety Officer. In situations where the Health and Safety Officer cannot observe the entire work area, such as the rim area and bottom of a canyon, wash or arroyo, two or more Health and Safety Officers shall be required. Following are the qualifications for and the duties of a Health and Safety Officer. Table I-2 provides the cost for Health and safety activities.

a) The Health and Safety Officer shall have completed the 40 hour HAZWOPER Health and Safety training and have current recertification.

b) On the morning of the first day of the project, the Health and Safety Officer shall conduct a briefing for all workers explaining each portion of the safety plan, including the contingency plan for emergencies. Adequate time shall be allocated to ensure that workers understand all aspects of the health and safety plan.

c) The Health and Safety Officer shall conduct a safety briefing each morning. The Health and Safety Officer shall use examples out of the Health and Safety Plan or observed unsafe practices as talking points.

d) The Health and Safety Officer shall maintain a daily safety log noting the date, weather conditions, hourly temperature, visitors, including duration of visit, number of workers on the job site, and any injuries.

e) Less serious injuries should be noted in the daily log. In conjunction with the Site Supervisor, the Health and Safety Officer shall investigate any injury. A written report shall be prepared for any injury necessitating a visit to a medical facility, requiring hospitalization, or resulting in death.

f) Each day the Health and Safety Officer shall ensure that the Site Supervisor has a supply of fresh potable water, electrolyte fluids, bandages, 1% aqueous chlorine bleach disinfectant spray, Tyvek plastic overalls, dust masks, gloves, etc., for distribution to the workers.

g) During weather emergencies and periods of potential heat injury, the Health and Safety Officer shall ensure that there is adequate shelter and that appropriate rest breaks are taken by the site workers.

h) The Health and Safety Officer shall periodically walk the site observing safety practices and issuing warnings, as appropriate.

i) The Health and Safety Officer shall report any flagrant violators of safety practices to the Site Supervisor. In cooperation with the Site Supervisor, the Health and Safety Officer shall evict flagrant violators.

j) The Health and Safety Officer shall serve as the local government's representative to unexpected visitors to the site. For their safety, visitors shall be escorted while on site and kept well away from the working areas.

k) The Health and Safety Officer shall refer the media to the appropriate regulatory agency Supervisor for information.

5) PROTECTION OF THE PUBLIC

a) Work at a solid waste site can be hazardous. The public shall not be allowed at site closure/clean up projects. The Site Supervisor shall establish tape barriers at the entrance to the work site and post signs indicating the limited access conditions. The public shall be asked to vacate the premises. The Health and Safety Officer shall insure that no one passes these tape barriers without the proper safety equipment and orientation. The Health and Safety Officer or Site Supervisor shall accompany legitimate visitors on the site. These include agents of the local, state, tribal, or federal governments performing official duties directly connected to the closure/clean up site.

b) News media personnel may want to tour the site and seek statements from the workers about the project. News media personnel are prohibited from entering the work site due to safety restrictions. They shall be instructed to contact the appropriate local, state, tribal, or federal government's regulatory agency Supervisor for information.

c) The Site Supervisor shall insure that yellow tape barriers are erected around any open trench at the end of the work day. "No Trespassing" signs shall be posted at the entrance to the work site at the end of each working day.

d) Each load of waste shall be disinfected with a 1% aqueous

chlorine bleach solution as it is loaded into a transportation container.

e) All loads being transported shall be covered sufficiently to prevent loss of material during transport. If the nature of the waste may pose a threat to the public along the route to the designated MSWLF receiving it, appropriate warnings shall be issued to those likely to be affected. Containers with waste left at the site shall be covered overnight. Cover shall be sufficient to prevent animal invasion.

Table I-2 Health and Safety Costs

Personal protective equipment:	**$523.00**
Shovels, tongs, sprayers, etc.:	**$261.00**
Pulley & cable systems:	**$281.00**
First aid supplies:	**$101.00**
Portable toilets, rental:	**$247.00**
Fire fighting equipment, rental:	**$132.00**
Rodent eradication program:	**$471.00**
Tape barriers, signage:	**$ 64.00**
Labor:	**$2,683.00**
Total	**$4,763.00**

F. PUBLIC PARTICIPATION PLAN

Announcements of the upcoming clean up and removal operation will be placed in the local newspaper, one each week for the four weeks preceding the start of the clean up procedure. Each notice will specify site locations and projected start/finish dates. Notice will be given that sites will be cordoned off and quarantined. Parental cooperation in keeping children away from the sites will be requested. Before and after photos will be taken and published along with a story commending those who participated in the clean up and removal operation.

A public meeting will be held one month prior to the project start date at

the Tribal Council Offices to address any public concerns. Information on proper waste disposal and recycling will be made available at the meeting as well as pertinent excerpts from the Illegal Dumping Codes.

Appropriate signs warning the public shall be posted at the work site as required in the Health and Safety Plan. Warnings to the public along the transportation route to the MSWLF site receiving the waste shall be issued as necessary.

Table I-3 Public Participation Costs

Newspaper Notices:	**$256.81**
Public Meeting:	**$100.00**
Photography:	**$ 23.90**
Signage:	**$ 56.74**
Total	**$437.45**

G. RECORD KEEPING

Records of daily clean up and removal activities will be maintained on site by the Site Supervisor, John Franks, telephone number (602)555-5555, during the clean up/removal process. This location information shall be posted at the main entrance to the work site during the clean up/removal process. When clean up removal has been completed all daily records, the final report, and the certification of completion will be maintained at the Tribal Council Offices at 234 Spotted Horse Way, Appaloosa, Az. 89054. Tribal Chair Jane Jones, telephone number (602) 555-1234, shall be responsible for all records.

Generating the necessary records will require the services of the Tribal Council Secretary at a total cost of $178. Storage will be provided free of charge.

Table I-4 Record Keeping Costs

Secretarial services:	**$178.00**
Total	**$178.00**

APPENDIX II

HAZARDOUS MATERIALS

Sites may contain a mixture of waste types including green or agricultural waste, household or municipal waste, industrial or commercial waste, and hazardous waste. Hazardous wastes require special handling. They must be removed from the site and disposed of separately. The complete listing of federally regulated hazardous wastes can be found in 40 CFR Part 261. Examples of potentially hazardous wastes include but are not limited to: paints, oils, pesticides, cleaning compounds, solvents, acid and alkali solutions, pool chemicals, asbestos, antifreeze, explosives, radioactive substances, drugs, and used oil filters. See Table II-1 for a list of some common household hazardous wastes. Typically states have expanded lists of materials that they consider to be hazardous and that require additional handling and disposal requirements. It is recommended that the appropriate state or local environmental regulatory agency be contacted for this information. Some potentially hazardous materials may not be readily obvious, such as asbestos or lead. These substances can be present in construction debris such as old sheetrock and painted materials. Asbestos may also be found in pipes combined with concrete known as "transite pipe," roofing shingles, and some types of insulation materials. Asbestos is harmful if it is in a friable state, i.e., particles are small enough to become airborne. 40 CFR Part 61.50 sets forth reporting requirements and mandatory standards for disposal of asbestos-containing wastes. If such wastes are found at any waste site, a contractor licensed to properly dispose of asbestos must be used for such disposal. If a site has a history of burning wastes, the resulting ash will need to be tested as it may be hazardous. For questions concerning either a potentially hazardous material or handling and disposition of potentially hazardous materials call the USEPA or the appropriate state environmental program.

Common Household Hazardous Wastes

Table II-1

(These items and others not included on this list, might contain materials that are ignitable, corrosive, reactive, or toxic.)

- **Drain openers**
- **Oven cleaners**
- **Wood and metal cleaners and polishers**
- **Automotive oil and fuel additives**
- **Grease and rust solvents**
- **Carburetor and fuel injection cleaners**
- **Air conditioning refrigerant**
- **Starter fluids**
- **Paint thinners**
- **Paint strippers and removers**
- **Adhesives**
- **Herbicides**
- **Insecticides**
- **Fungicides/wood preservatives**

Source: A survey of Household Hazardous Wastes and Related Collection Programs, Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency. EPA/530-86-038.

APPENDIX III

SITE CLEAN UP

Each site is unique and requires an individual evaluation of the extent of clean up that needs to be done. The following suggests the kind of issues which need to be considered in making site specific clean up decisions.

There is always the potential for improperly disposed waste to have impacted groundwater resources. In such cases, groundwater remediation may be required as part of the site clean up. Some of the factors that need to be considered when assessing potential groundwater impacts and the need for clean up, include: What is the depth to groundwater at the site? What is the nature of the waste deposited there? Were liquid wastes ever buried at the site? Is the groundwater at the site used as a drinking water source? If so, what is the distance to the nearest drinking water well?

If the site has contaminated a drinking water supply well, then the site may also be violating the Federal Safe Drinking Water Act, 42 U.S.C.A.300f to 300j-26, and 40 CFR Part 141. Any impacts on groundwater resources in the area will affect the site-specific clean up requirements.

If a site is located in or adjacent to an arroyo, wash, intermittent stream bed, river bed, pond, or lake, then the potential for surface water contamination exists and the site may be in violation of the Federal Clean Water Act (CWA), 33 U.S.C.A. 1251-1387, and 40 CFR Part 230. If the site is located in a surface water feature that meets the definition of a "navigable water" or a "water of the United States," as defined in 502 of the CWA and 40 CFR Part 230.3, then the site may be an unpermitted fill of these waters and require clean up.

If any nearby surface waters are classified as "navigable waters" or as "waters of the United States", as defined in Section 502 of the CWA and 40 CFR Parts 116.3 and 117.1, the site may be in violation of the CWA for discharging waste/fill material or hazardous substances, as defined in 40 CFR Part 116, to these waters.

Some basic questions that need to be asked include: Is there evidence that wastes have been washed into these waters? Do the site surface water run-off features drain toward the nearby waterways? Is there evidence of visibly contaminated water draining to the adjacent waterways? If the answers to any of these questions is yes, then a more comprehensive site assessment program and clean up effort may be required. Any work, including clean up, that occurs within a jurisdictional water of the United States may require a consultation with the Army Corps of Engineers to determine if a Section 404 permit is required. If there are known endangered species in the area, this information needs to be factored into the clean up process. The presence of endangered species may also affect the actual clean up work by requiring mitigation measures for impacted species.

Appropriate clean up activities for contaminated soils depend upon whether the soil has or may impact groundwater or surface water and on the intended reuse of the property. Contaminated sites whose reuse may be for home or school construction could require a greater degree of soil clean up than property which will be left as open space. The potential or actual impacts to groundwater or property reuse will effect the amount of soil clean up needed at a site. An alternative to a complete clean up of contaminants may be permitted through appropriate and enforceable land use restrictions on the property (institutional controls).

Sites on land other than Indian lands must meet applicable state and federal regulations. It is therefore recommended that decision-makers seek the advice and assistance of the state agencies and the federal EPA in developing criteria for determining the appropriate level of remediation for a specific site. It is also advisable to determine whether sampling will be necessary to insure complete removal of wastes, some of which may have migrated below the surface.

APPENDIX IV

IF YOUR TRIBE HAS ESTABLISHED CODES AND ORDANCES GOVERNING THE DISOSAL OF SOLID WASTE, THEY SHOULD BE REFERENCED IN THE CLEAN UP PLAN. GIVEN BELOW IS AN EXAMPLE JURISDICTION ESTABLISHING SUCH AUTHORITY.

SAMPLE JURISDICTION

(DERIVED FROM THE NAVAJO NATION)

1. **THE NATIVE AMERICAN TRIBAL COUNCIL IS THE GOVERNING BODY OF THE NATIVE AMERICAN TRIBE, PURSUANT TO NATIVE AMERICAN TRIBAL CODE '102 (A); AND**

2. **THE NATIVE AMERICAN TRIBAL COUNCIL IN 1972 RECOGNIZED THE NEED TO ESTABLISH WITHIN THE NATIVE AMERICAN TRIBAL GOVERNMENT, MECHANISMS TO PROTECT ENVIRONMENTAL QUALITY, AND TO ESTABLISHED THE NATIVE AMERICAN TRIBAL ENVIRONMENTAL COMMISSION BY RESOLUTION NAT-72-72 (SEPTEMBER 10, 1972), CODIFIED AS AMENDED AT 2 N.A.T.C. " 3402, ET SEQ., (1978) AND**

3. **THE ENACTMENT OF RESOLUTION NAT-72-72 CONSTITUTED FORMAL RECOGNITION BY THE NATIVE AMERICAN TRIBE OF THE INTIMATE RELATIONSHIP BETWEEN THE NATURAL ENVIRONMENT AND THE QUALITY OF LIFE OF HUMAN BEINGS. IN THE NATIVE AMERICAN WAY, SPIRITUAL, PHYSICAL AND MENTAL WELL-BEING IS ROOTED FUNDAMENTALLY IN NATURE. THE NATIVE AMERICAN CULTURE PROMOTES AND VALUES RESPECT FOR THE KNOWLEDGE OF THE HARMONIOUS, BALANCED AND SACRED INTERDEPENDENCE OF ALL ASPECTS OF LIFE ON THE EARTH. IN THE NATIVE AMERICAN WAY, THE EARTH IS OUR MOTHER, THE MOUNTAINS PART OF HER SACRED BODY, THE WATER COURSES HER VEINS AND ARTERIES. WHEN THE EARTH IS INJURED, THE RESULTANT INSTABILITY, IMBALANCE AND DISHARMONY BRING ILLNESS TO LIFE ON EARTH INCLUDING HUMAN KIND. HARMONY AND BALANCE ARE RESTORED THROUGH A RECOGNITION OF THE CONDITIONS THAT LED TO DISHARMONY AND BALANCE. THUS, THE INTEGRITY AND HEALTH OF THE NATIVE AMERICAN ENVIRONMENT ARE INTIMATELY RELATED TO THE HEALTH AND WELL-BEING OF PRESENT AND FUTURE GENERATIONS OF NATIVE AMERICAN PEOPLE. IT IS THE BIRTHRIGHT OF EVERY NATIVE AMERICAN TO ENJOY CLEAN AIR, CLEAN WATER, ABUNDANT SUNSHINE AND ALL THE GIFTS BESTOWED BY A CLEAN AND SAFE ENVIRONMENT; AND**

4. THE NATIVE AMERICAN TRIBE HAS GREATLY ENHANCED ITS CAPABILITIES TO PROTECT THE ENVIRONMENT AND HAS DRAMATICALLY INCREASED ITS GOVERNMENTAL AWARENESS OF, AND EXPERTISE REGARDING, ENVIRONMENTAL CONTAMINANTS IN ALL MEDIA (AIR, WATER, SOILS, ETC.) SINCE THE NATIVE AMERICAN TRIBAL COUNCIL CREATED THE NATIVE AMERICAN TRIBAL ENVIRONMENTAL PROTECTION COMMISSION IN 1972; AND

5. ADVANCES IN TECHNOLOGY AND CHANGES IN APPLICABLE LAW REQUIRE THAT THE NATIVE AMERICAN TRIBE FURTHER STRENGTHEN ITS EXECUTIVE AGENCY CHARGED WITH ENVIRONMENTAL PROTECTION; AND

6. BY RESOLUTION NAT-68-89 (NOVEMBER 15, 1989), THE NATIVE AMERICAN TRIBAL COUNCIL COMPREHENSIVELY AMENDED TITLE 2 OF THE NATIVE AMERICAN TRIBAL CODE FOR THE PURPOSE, AMONG OTHERS, OF PROVIDING FOR A SEPARATION OF POWERS OF THE EXECUTIVE AND LEGISLATIVE BRANCHES OF THE NATIVE AMERICAN TRIBE; AND

7. THE STRUCTURE AND PLAN OF OPERATION OF THE NATIVE AMERICAN TRIBAL ENVIRONMENTAL PROTECTION COMMISSION IS NO LONGER CONSISTENT WITH THE PHILOSOPHY OF THE NATIVE AMERICAN TRIBE, NOR IS IT ADEQUATE TO PROTECT THE QUALITY OF THE ENVIRONMENT OF THE NATIVE AMERICAN TRIBE; AND

8. THERE IS A NEED TO ESTABLISH THE "ENVIRONMENTAL PROTECTION AGENCY" AS AN INDEPENDENT REGULATORY AGENCY WITHIN THE EXECUTIVE BRANCH WITH REGULATORY, MONITORING AND ENFORCEMENT AUTHORITY OVER MATTERS RELATING TO THE QUALITY OF THE ENVIRONMENT OF THE NATIVE AMERICAN TRIBE, AND OVER ANY PERSON OR ENTITY, BROADLY DEFINED, DOING BUSINESS WITHIN, OR OTHERWISE AFFECTING THE ENVIRONMENT OF THE NATIVE AMERICAN TRIBE; AND

9. THE NATIVE AMERICAN TRIBAL COUNCIL HAS THE AUTHORITY AND THE RESPONSIBILITY FOR ESTABLISHING THE GENERAL POLICY OF THE NATIVE AMERICAN TRIBE'S GOVERNMENT WITH RESPECT TO ENVIRONMENTAL QUALITY, AND IT IS APPROPRIATE FOR THE NATIVE AMERICAN TRIBE TO ADOPT AN ENVIRONMENTAL POLICY ACT IN ORDER TO PROVIDE GUIDANCE AND DIRECTION FOR THE NATIVE AMERICAN TRIBES ENVIRONMENTAL PROTECTION AGENCY AND TO INFORM PERSONS AND ENTITIES RESIDING OR DOING BUSINESS WITHIN THE NATIVE AMERICAN TRIBE OF THAT PHILOSOPHY AND DIRECTION; AND

10. BY RESOLUTION NAT-38-94 THE GOVERNMENT SERVICES COMMITTEE OF THE NATIVE AMERICAN TRIBAL COUNCIL HAS APPROVED AND RECOMMENDED ENABLING LEGISLATION TO AMEND 2 N.A.T.C. '3402 ET SEQ., FOR THE PURPOSE OF ESTABLISHING THE ENVIRONMENTAL PROTECTION AGENCY; AND

11. BY RESOLUTION NAT-073-94 THE RESOURCES COMMITTEE OF THE NATIVE AMERICAN TRIBAL COUNCIL HAS RECOMMENDED AMENDING NAT-72-72 (AS AMENDED BY RESOLUTION NAT-94-76) FOR THE PURPOSES OF ESTABLISHING THE ENVIRONMENTAL PROTECTION AGENCY AND THE ADOPTION OF THE NATIVE AMERICAN TRIBES ENVIRONMENTAL POLICY ACT; AND

12. BY RESOLUTION NAT-50-94 THE GOVERNMENT SERVICES COMMITTEE OF THE NATIVE AMERICAN TRIBAL COUNCIL HAS APPROVED THE PLAN OF OPERATION OF THE NATIVE AMERICAN TRIBAL ENVIRONMENTAL PROTECTION AGENCY.

THIS RESOLUTION WAS APPROVED BY THE NATIVE AMERICAN TRIBAL COUNCIL ON THE 21ST DAY OF MAY, 1995.

BELOW ARE QUOTED PORTIONS OF EXHIBIT A TO THE ABOVE RESOLUTION:

SUBCHAPTER 93. ENVIRONMENTAL PROTECTION AGENCY ' 3403. AUTHORITY

IN IMPLEMENTING THE PURPOSES OF THE ENVIRONMENTAL PROTECTION AGENCY, THE DIRECTOR SHALL HAVE THE POWER:

A. TO ADOPT (GIVE FINAL APPROVAL) AND ENFORCE RULES, PROVIDED THAT THESE RULES SHALL BE ADOPTED ONLY AFTER NOTICE AND COMMENT, PURSUANT TO RULES PROMULGATED BY THE DIRECTOR AND APPROVAL OF THE RESOURCES COMMITTEE OF THE NATIVE AMERICAN TRIBE;

B. TO ISSUE CEASE AND DESIST ORDERS, COMPLIANCE ORDERS OR SUCH OTHER ORDERS AS THE DIRECTOR SHALL DEEM NECESSARY TO ENFORCE ENVIRONMENTAL PROTECTION AGENCY REGULATIONS TO PROHIBIT OR PUT TO A STOP ACTIVITIES THAT MAY POSE AN IMMINENT AND SUBSTANTIAL DANGER TO THE PUBLIC HEALTH OR THE ENVIRONMENT;

C. TO IMPLEMENT BY REGULATION, RULES FOR ADMINISTRATIVE APPEAL OF ANY ADVERSE ACTION TAKEN BY NATIVE AMERICAN TRIBAL ENVIRONMENTAL PROTECTION AGENCY PURSUANT TO THE AUTHORITY OF THIS SECTION AND TO ISSUE FINAL AGENCY DECISIONS.

D. TO LEVY CIVIL PENALTIES FOR EACH DAY OF VIOLATION OF ANY ORDER ISSUED BY THE DIRECTOR; PROVIDED, HOWEVER, THAT ANY PERSON OR ENTITY AS DEFINED IN 2 N.A.T.C. ' 3305 SHALL HAVE THE RIGHT TO APPEAL ANY CIVIL PENALTY TO THE COURTS OF THE NATIVE AMERICAN TRIBE AS SPECIFICALLY PROVIDED IN THE CHAPTERS ADMINISTERED BY THE NATIVE AMERICAN TRIBAL ENVIRONMENTAL

PROTECTION AGENCY. NO APPEAL SHALL OPERATE TO STAY AN ORDER UNLESS THE COURT DETERMINES, AFTER A HEARING, THAT THERE IS NO BASIS IN FACT TO SUPPORT THE ORDER OR THAT THE ORDER IS NOT IN COMPLIANCE WITH APPLICABLE LAW;

E. TO TAKE SUCH ACTIONS AS MAY BE NECESSARY OR APPROPRIATE TO IMPLEMENT THE PURPOSES OF THE ENVIRONMENTAL PROTECTION AGENCY;

F. TO CARRY OUT ANY OTHER POWERS CONSISTENT WITH THE PURPOSES OF THE ENVIRONMENTAL PROTECTION AGENCY THAT MAY BE AUTHORIZED IN ITS PLAN OF OPERATION UPON RECOMMENDATION OF THE RESOURCES COMMITTEE AND APPROVAL OF THE GOVERNMENT SERVICES COMMITTEE.

3405. JURISDICTION

THE NATIVE AMERICAN TRIBAL ENVIRONMENTAL PROTECTION AGENCY HAS REGULATORY, MONITORING, AND ENFORCEMENT AUTHORITY OVER ALL NATURAL RESOURCES RELATING TO THE QUALITY OF THE ENVIRONMENT WITHIN THE NATIVE AMERICAN TRIBE, AS DEFINED IN N.A.T.C. ' 254, AND OVER ANY PERSON, INCLUDING BUT NOT LIMITED TO NATIVE AMERICAN CITIZENS, ENTERPRISES, CORPORATIONS, ASSOCIATIONS, PARTNERSHIPS, CHAPTERS, TRIBAL GOVERNMENTS OR OTHER ENTITIES; NON-NATIVE AMERICAN TRIBE INDIVIDUALS, CORPORATIONS, ASSOCIATIONS, PARTNERSHIPS, OTHER ENTITIES, SUCCESSORS AND ASSIGNS; STATES, COUNTIES, LOCAL GOVERNMENTS AND OTHER AGENCIES; AND THE UNITED STATES WHERE NOT PROHIBITED BY APPLICABLE LAWS, DOING BUSINESS WITHIN OR OTHERWISE AFFECTING THE ENVIRONMENT OF THE NATIVE AMERICAN TRIBE.

APPENDIX V

HANTAVIRUS ILLNESS IN THE UNITED STATES

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These recommendations were developed in part with the assistance of expert consultants during a meeting on rodent ecology and control convened at the Centers for Disease Control and Prevention on July 6,1993.
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Hantavirus Infection -- Southwestern United States: Interim Recommendations for Risk Reduction

SUMMARY

This report provides interim recommendations for prevention and control of hantavirus infections associated with rodents in the southwestern United States. It is based on principles of rodent and infection control and contains specific recommendations for reducing rodent shelter and food sources in and around the home, recommendations for eliminating rodents inside the home and preventing them from entering the home, precautions for preventing hantavirus infection while rodent-contaminated areas are being cleaned up, prevention measures for persons who have occupational exposure to wild rodents, and precautions for campers and hikers.

INTRODUCTION

The recently recognized hantavirus-associated disease among residents of the southwestern United States (1-4) and the identification of rodent reservoirs for the virus in the affected areas warrant recommendations to minimize the risk of exposure to rodents for both residents and visitors. While information is being gathered about the causative virus and its epidemiology, provisional recommendations can be made on the basis of knowledge about related hantaviruses.

These recommendations are based on current understanding of the epidemiologic features of hantavirus infections in the Southwest; they will be periodically evaluated and modified as more information becomes available.

Rodents are the primary reservoir hosts of recognized hantaviruses. Each hantavirus appears to have preferential rodent hosts, but other small mammals can be infected as well (5,6). Available data strongly suggest that the deer mouse (Peromyscus maniculatus) is the primary reservoir of the newly recognized hantavirus in the southwestern United States (1). Serologic evidence of infection has also been found in pinon mice (P. truei), brush mice (P. boylii), and western chipmunks (Tamias spp.). P. maniculatus is highly adaptable and is found in different habitats, including human residences in rural and semirural areas, but generally not in urban centers. Hantaviruses do not cause apparent illness in their reservoir hosts (7). Infected rodents shed virus in saliva, urine, and feces for many weeks, but the duration and period of maximum infectivity are unknown (8-11). The demonstrated presence of infectious virus in saliva of infected rodents and the marked sensitivity of these animals to hantaviruses following inoculation suggests that biting may be an important mode of transmission among rodents (7).

Human infection may occur when infective saliva or excreta are inhaled as aerosols produced directly from the animal. Persons visiting laboratories where infected rodents were housed have been infected after only a few minutes of exposure to animal holding areas (12). Transmission may also occur when dried materials contaminated by rodent excreta are disturbed, directly introduced into broken skin, introduced onto the conjunctivae, or, possibly, ingested in contaminated food or water. Persons have also become infected after being bitten by rodents (13,14).

Arthropod vectors are not known to have a role in the transmission of hantaviruses (7,12). Person-to-person transmission has not been associated with any of the previously identified hantaviruses (9) or with the recent outbreak in the Southwest. Cats and dogs are not known to be reservoir hosts of hantaviruses in the United States. However, these domestic animals may bring infected rodents into contact with humans.

Known hantavirus infections of humans occur primarily in adults and are associated with domestic, occupational, or leisure activities that bring humans into contact with infected rodents, usually in a rural setting. Patterns of seasonal occurrence differ, depending on the virus, species of rodent host, and patterns of human behavior (5,7). Cases have been epidemiologically associated with the following situations:

- planting or harvesting field crops;
- occupying previously vacant cabins or other dwellings;
- cleaning barns and other outbuildings;
- disturbing rodent-infested areas while hiking or camping;
- inhabiting dwellings with indoor rodent populations;

- residing in or visiting areas in which the rodent population has shown an increase in density (15-17).

Hantaviruses have lipid envelopes that are susceptible to most disinfectants (e.g., dilute hypochlorite solutions, detergents, ethyl alcohol [70%], or most general-purpose household disinfectants) (18). How long these viruses survive after being shed in the environment is uncertain.

The reservoir hosts of the hantavirus in the southwestern United States also act as hosts for the bacterium Yersinia pestis, the etiologic agent of plague. Although fleas and other ectoparasites are not known to play a role in hantavirus epidemiology, rodent fleas transmit plague. Control of rodents without concurrent control of fleas may increase the risk of human plague as the rodent fleas seek an alternative food source.

Eradicating the reservoir hosts of hantaviruses is neither feasible nor desirable. The best currently available approach for disease control and prevention is risk reduction through environmental hygiene practices that deter rodents from colonizing the home and work environment.

GENERAL HOUSEHOLD PRECAUTIONS IN AFFECTED AREAS

Although epidemiologic studies are being conducted to identify specific behaviors that may increase the risk for hantavirus infection in humans in the United States, rodent control in and around the home will continue to be the primary prevention strategy (Box 1). CDC has issued recommendations for rodent-proofing urban and suburban dwellings and reducing rodent populations through habitat modification and sanitation (19,20).

Box 1. General precautions for residents of affected areas

- Eliminate rodents and reduce the availability of food sources and nesting sites used by rodents inside the home.
- Follow the recommendations in the section on Eliminating Rodents Inside the Home.
- Keep food (including pet food) and water covered and stored in rodent-proof metal or thick plastic containers with tight-fitting lids.
- Store garbage inside homes in rodent-proof metal or thick plastic containers with tight-fitting lids.
- Wash dishes and cooking utensils immediately after use and remove all spilled food.
- Dispose of trash and clutter.
- Use spring-loaded rodent traps in the home continuously.
- As an adjunct to traps, use rodenticide with bait under a plywood or plastic shelter (covered bait station) on an ongoing basis inside the house.

Note: Environmental Protection Agency (EPA)-approved rodenticides are commercially

available. Instructions on product use should always be followed. Products that are used outdoors should be specifically approved for exterior use. Any use of a rodenticide should be preceded by use of an insecticide to reduce the risk of plague transmission. Insecticide sprays or powders can be used in place of aerosols if they are appropriately labeled for flea control.

Prevent rodents from entering the home. Specific measures should be adapted to local circumstances.

- Use steel wool or cement to seal, screen, or otherwise cover all openings into the home that have a diameter greater than or equal to 1/4 inch.
- Place metal roof flashing as a rodent barrier around the base of wooden, earthen, or adobe dwellings up to a height of 12 inches and buried in the soil to a depth of 6 inches.
- Place 3 inches of gravel under the base of homes or under mobile homes to discourage rodent burrowing.
- Reduce rodent shelter and food sources within 100 feet of the home.
- Use raised cement foundations in new construction of sheds, barns, outbuildings, or woodpiles.
- When possible, place woodpiles 100 feet or more from the house, and elevate wood at least 12 inches off the ground.
- Store grains and animal feed in rodent-proof containers.
- Near buildings, remove food sources that might attract rodents, or store food and water in rodent-proof containers.
- Store hay on pallets, and use traps or rodenticide continuously to keep hay free of rodents.
- Do not leave pet food in feeding dishes.
- Dispose of garbage and trash in rodent-proof containers that are elevated at least 12 inches off the ground.
- Haul away trash, abandoned vehicles, discarded tires, and other items that may serve as rodent nesting sites.
- Cut grass, brush, and dense shrubbery within 100 feet of the home.
- Place spring-loaded rodent traps at likely spots for rodent shelter within 100 feet around the home, and use continuously.
- Use an EPA-registered rodenticide approved for outside use in covered bait stations at places likely to shelter rodents within 100 feet of the home.

NOTE: Follow the recommendations specified in the section on Clean-Up of Rodent-Contaminated Areas if rodent nests are encountered while these measures are being carried out.

ELIMINATING RODENTS INSIDE THE HOME AND REDUCING RODENT ACCESS TO THE HOME

Rodent infestation can be determined by direct observation of animals or inferred from the presence of feces in closets or cabinets or on floors, or from evidence that rodents have been gnawing at food. If rodent infestation is detected inside the home or outbuildings, rodent abatement measures should be completed (Box 2). The directions in the section on Special Precautions should be followed if evidence of heavy rodent infestation (e.g., piles of feces or numerous dead animals) is present or if a structure is associated with a confirmed case of hantavirus disease.

Box 2. Eliminating rodent infestation: Guidance for residents of affected areas

- Before rodent elimination work is begun, ventilate closed buildings or areas inside buildings by opening doors and windows for at least 30 minutes. Use an exhaust fan or cross ventilation if possible. Leave the area until the airing-out period is finished. This airing may help remove any aerosolized virus inside the closed-in structure.
- Seal, screen, or otherwise cover all openings into the home that have a diameter greater than or equal to 1/4 inch. Then set rodent traps inside the house, using peanut butter as bait. Use only spring-loaded traps that kill rodents.
- Treat the interior of the structure with an insecticide labeled for flea control; follow specific label instructions. Insecticide sprays or powders can be used in place of aerosols if they are appropriately labeled for flea control. Rodenticides may also be used while the interior is being treated, as outlined below.
- Remove captured rodents from the traps. Wear rubber or plastic gloves while handling rodents. Place the carcasses in a plastic bag containing a sufficient amount of a general-purpose household disinfectant to thoroughly wet the carcasses. Seal the bag and then dispose of it by burying in a 2- to 3-foot-deep hole or by burning. If burying or burning are not feasible, contact your local or state health department about other appropriate disposal methods. Rebait and reset all sprung traps.
- Before removing the gloves, wash gloved hands in a general household disinfectant and then in soap and water. A hypochlorite solution prepared by mixing 3 tablespoons of household bleach in 1 gallon of water may be used in place of a commercial disinfectant. When using the chlorine solution, avoid spilling the mixture on clothing or other items that may be damaged. Thoroughly wash hands with soap and water after removing the gloves.
- Leave several baited spring-loaded traps inside the house at all times as a further precaution against rodent reinfestation. Examine the traps regularly. Disinfect traps no longer in use by washing in a general household disinfectant or the hypochlorite solution. Disinfect and wash gloves as described above, and wash hands thoroughly with soap and water before beginning other activities.

CLEAN-UP OF RODENT-CONTAMINATED AREAS

Areas with evidence of rodent activity (e.g., dead rodents, rodent excreta) should be thoroughly cleaned to reduce the likelihood of exposure to hantavirus-infected materials. Clean-up procedures must be performed in a manner that limits the potential for aerosolization of dirt or dust from all potentially contaminated surfaces and household goods (Box 3).

Box 3. Clean-up of rodent-contaminated areas: Guidance for residents of affected areas

- Persons involved in the clean-up should wear rubber or plastic gloves.
- Spray dead rodents, rodent nests, droppings, or foods or other items that have been tainted by rodents with a general-purpose household disinfectant. Soak the material thoroughly, and place in a plastic bag. When clean-up is complete (or when the bag is full), seal the bag, then place it into a second plastic bag and seal. Dispose of the bagged material by burying in a 2- to 3-foot-deep hole or by burning. If these alternatives are not feasible, contact the local or state health department concerning other appropriate disposal methods.
- After the above items have been removed, mop floors with a solution of water, detergent, and disinfectant. Spray dirt floors with a disinfectant solution. A second mopping or spraying of floors with a general-purpose household disinfectant is optional. Carpets can be effectively disinfected with household disinfectants or by commercial-grade steam cleaning or shampooing. To avoid generating potentially infectious aerosols, do not vacuum or sweep dry surfaces before mopping.
- Disinfect countertops, cabinets, drawers, and other durable surfaces by washing them with a solution of detergent, water, and disinfectant, followed by an optional wiping-down with a general-purpose household disinfectant.
- Rugs and upholstered furniture should be steam cleaned or shampooed. If rodents have nested inside furniture and the nests are not accessible for decontamination, the furniture should be removed and burned.
- Launder potentially contaminated bedding and clothing with hot water and detergent. (Use rubber or plastic gloves when handling the dirty laundry; then wash and disinfect gloves as described in the section on Eliminating Rodents Inside the Home.) Machine-dry laundry on a high setting or hang it to air dry in the sun.

SPECIAL PRECAUTIONS FOR HOMES OF PERSONS WITH CONFIRMED HANTAVIRUS INFECTION OR BUILDINGS WITH HEAVY RODENT INFESTATIONS

Special precautions are indicated in the affected areas for cleaning homes or buildings with heavy rodent infestations (Box 4). Persons conducting these activities should contact the responsible local, state, or federal public health agency for guidance. These precautions may also apply to vacant dwellings that have attracted numbers of rodents while unoccupied and to dwellings and other structures that have been occupied by persons with confirmed hantavirus infection. Workers who are either hired specifically to perform the clean-up or asked to do so as part of their work activities should receive a thorough orientation from the responsible health agency

about hantavirus transmission and should be trained to perform the required activities safely.

Box 4. Special precautions for clean-up in homes of persons with hantavirus infection or buildings with heavy rodent infestation

- A baseline serum sample, preferably drawn at the time these activities are initiated, should be available for all persons conducting the clean-up of homes or buildings with heavy rodent infestation. The serum sample should be stored at -20 C.
- Persons involved in the clean-up should wear coveralls (disposable if possible), rubber boots or disposable shoe covers, rubber or plastic gloves, protective goggles, and an appropriate respiratory protection device, such as a half-mask air-purifying (or negative-pressure) respirator with a high-efficiency particulate air (HEPA) filter or a powered air-purifying respirator (PAPR) with HEPA filters. Respirators (including positive-pressure types) are not considered protective if facial hair interferes with the face seal, since proper fit cannot be assured. Respirator practices should follow a comprehensive user program and be supervised by a knowledgeable person (21).
- Personal protective gear should be decontaminated upon removal at the end of the day. If the coveralls are not disposable, they should be laundered on site. If no laundry facilities are available, the coveralls should be immersed in liquid disinfectant until they can be washed.
- All potentially infective waste material (including respirator filters) from clean-up operations that cannot be burned or deep buried on site should be double bagged in appropriate plastic bags. The bagged material should then be labeled as infectious (if it is to be transported) and disposed of in accordance with local requirements for infectious waste.
- Workers who develop a febrile or respiratory illness within 45 days of the last potential exposure should immediately seek medical attention and inform the attending physician of the potential occupational risk of hantavirus infection. The physician should contact local health authorities promptly if hantavirus-associated illness is suspected. A blood sample should be obtained and forwarded with the baseline serum through the state health department to CDC for hantavirus antibody testing.

PRECAUTIONS FOR WORKERS IN AFFECTED AREAS WHO ARE REGULARLY EXPOSED TO RODENTS

Persons who frequently handle or are exposed to rodents (e.g., mammalogists, pest-control

workers) in the affected area are probably at higher risk for hantavirus infection than the general public because of their frequency of exposure. Therefore, enhanced precautions are warranted to protect them against hantavirus infection (Box 5).

Box 5. Precautions for workers in affected areas who are exposed to rodents

- o A baseline serum sample, preferably drawn at the time of employment, should be available for all persons whose occupations involve frequent rodent contact. The serum sample should be stored at -20C.
- o Workers in potentially high-risk settings should be informed about the symptoms of the disease and be given detailed guidance on prevention measures.
- o Workers who develop a febrile or respiratory illness within 45 days of the last potential exposure should immediately seek medical attention and inform the attending physician of the potential occupational risk of hantavirus infection. The physician should contact local health authorities promptly if hantavirus-associated illness is suspected. A blood sample should be obtained and forwarded with the baseline serum through the state health department to CDC for hantavirus antibody testing.
- o Workers should wear a half-face air-purifying (or negative-pressure) respirator or PAPR equipped with HEPA filters when removing rodents from traps or handling rodents in the affected area. Respirators (including positive-pressure types) are not considered protective if facial hair interferes with the face seal, since proper fit cannot be assured. Respirator use practices should be in accord with a comprehensive user program and should be supervised by a knowledgeable person (21).
- o Workers should wear rubber or plastic gloves when handling rodents or handling traps containing rodents. Gloves should be washed and disinfected before removing them, as described above.
- o Traps contaminated by rodent urine or feces or in which a rodent was captured should be disinfected with a commercial disinfectant or bleach solution. Dispose of dead rodents as described in the section on Eliminating Rodents inside the Home.
- o Persons removing organs or obtaining blood from rodents in affected areas should contact the Special Pathogens Branch, Division of Viral and Rickettsial Diseases, National Center for Infectious Diseases, Centers for Disease Control and Prevention, [telephone (404) 639-1115] for detailed safety precautions.

PRECAUTIONS FOR OTHER OCCUPATIONAL GROUPS WHO HAVE POTENTIAL RODENT CONTACT

Insufficient information is available at this time to allow general recommendations regarding risks or precautions for persons in the affected areas who work in occupations with unpredictable or incidental contact with rodents or their habitations. Examples of such occupations include telephone installers, maintenance workers, plumbers, electricians, and certain construction workers. Workers in these jobs may have to enter various buildings, crawl spaces, or other sites that may be rodent infested. Recommendations for such circumstances must be made on a case-by-case basis after the specific working environment has been assessed and state or local health departments have been consulted.

PRECAUTIONS FOR CAMPERS AND HIKERS IN THE AFFECTED AREAS

There is no evidence to suggest that travel into the affected areas should be restricted. Most tourist activities pose little or no risk that travelers will be exposed to rodents or their excreta. However, persons engaged in outdoor activities such as camping or hiking should take precautions to reduce the likelihood of their exposure to potentially infectious materials (Box 6).

Box 6. Reducing risk of hantavirus infection: Guidance for hikers and campers

- Avoid coming into contact with rodents and rodent burrows or disturbing dens (such as pack rat nests).
- Do not use cabins or other enclosed shelters that are rodent infested until they have been appropriately cleaned and disinfected.
- Do not pitch tents or place sleeping bags in areas in proximity to rodent feces or burrows or near possible rodent shelters (e.g., garbage dumps or woodpiles).
- If possible, do not sleep on the bare ground. Use a cot with the sleeping surface at least 12 inches above the ground. Use tents with floors.
- Keep food in rodent-proof containers.
- Promptly bury (or--preferably--burn followed by burying, when in accordance with local requirements) all garbage and trash, or discard in covered trash containers.
- Use only bottled water or water that has been disinfected by filtration, boiling, chlorination, or iodination for drinking, cooking, washing dishes, and brushing teeth.

CONCLUSION

The control and prevention recommendations in this report represent general measures to minimize the likelihood of human exposure to hantavirus-infected rodents in areas of the southwestern United States affected by the outbreak of hantavirus-associated respiratory illness. Many of the recommendations may not be applicable or necessary in unaffected locales. The impact and utility of the recommendations will be assessed as they are implemented and will be continually reviewed by CDC and the involved state and local health agencies as additional epidemiologic and laboratory data related to the outbreak become available. If required, these recommendations may be supplemented or modified in the future.

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APPENDIX VI

EPA REGIONAL CONTACT INFORMATION

for
SOLID WASTE MATTERS
IN INDIAN COUNTRY

Region I (SPP)
JFK Federal Building
Boston, MA 02203-2211
Phone: (617) 918-1803
Fax: (617) 918-1809/1810
States: CT, ME, MA, NH, RI, VT

Region II (2DEPP-RPB)
290 Broadway
New York, NY 10007-1866
Phone: (212) 637-4099/4125
Fax: (212) 637-4437
States: NJ, NY, PR, VI

Region IV (4WD-RPB/RSS)
61 Forsyth Street
Atlanta, GA 30303
Phone: (404) 562-8457/8449/8503
Fax: (404) 562-8439
States: AL, FL, GA, KY, MS, NC, SC, TN

Region V (DRP-8J)
77 West Jackson Boulevard
Chicago, IL 60604
Phone: (312) 886-1019
Fax: (312) 353-4788
States: IL, IN, MI, MN, OH, WI

Region VI (6H-H)
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733
Phone: (214) 665-8195
Fax: (214) 665-7263
States: AR, LA, NM, OK, TX

Region VII (ARTD)
726 Minnesota Avenue
Kansas City, KS 66101-2728
Phone: (913) 551-7369
Fax: (913) 551-7521
States: IA, KS, MO, NE

Region VIII (8P2-HW)
999 18th Street, Suite 500
Denver, CO 80202-2466
Phone: (303) 312-7008
Fax: (303) 312-6064
States: CO, MT, ND, SD, UT, WY

Region IX (WST-7)
75 Hawthorne Street
San Francisco, CA 94105
Phone: (415) 744-2098/2099/2095
Fax: (415) 744-1044
States: AZ, CA, HI, NV, AS, GU

Region X (WCM-128)
1200 6th Avenue
Seattle, WA 98101
Phone: (206) 553-6639/8202
Fax: (206) 553-8509
States: AK, ID, OR, WA

RCRA Hotline (800) 424-9345

Municipal Solid Waste in Indian County Website (www.epa.gov/tribalmsw)